DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/03/2010 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. **Claims 1, 4, 5, 8, and 10-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Perozzi (US 5,498,355) in view of Waters (EP 0,434,464 A1) and Ozbalik (US 5,242,613).

With regard to **claims 1 and 10-13**, Perozzi discloses a lubricating oil composition comprised of hydrocarbyl dithiophosphate salt and dihydrocarbyl polysulfides (column 1, lines 6-10; column 2, lines 29-32; column 9, lines 38-41; column 16, lines 27-28). The hydrocarbyl portion is later disclosed as dihydrocarbyl since the formula of the hydrocarbyl dithiophosphate displays two hydrocarbyl moieties (column 9, lines 55-60). The polysulfides are further disclosed as typical and well known antiwear or extreme pressure additives (column 16, lines 27-28). Since Perozzi discloses more than one polysulfide, Perozzi clearly teaches a mixture of polysulfides.

The base oil of the composition is a mineral oil with a suitable viscosity for lubricating a crankcase (column 19, lines 23-24). The kinematic viscosity of the lubricating composition, as measured during the L-38 test that determines characteristics of crankcase lubricants, is disclosed as 14.05 cSt at 100 degrees Celsius (column 24, lines 44-49; column 25, lines 1-15). Therefore, the base oil would also share this kinematic viscosity, since it is suitable for lubricating a crankcase.

Perozzi further discloses additional additives in the composition including corrosion inhibitors, rust inhibitors, antifoam agents, and dispersants (column 15, lines 16-19; column 16, lines 13-18; column 17, line 25). The dispersant is further disclosed as a boronated ashless Mannich base dispersant (column 17, lines 25-36, 50-58). Mannich base dispersants and succinimide dispersants are well known in the art and

can be utilized interchangeably so that it would have been obvious to one of ordinary skill at the time of the invention for Perozzi to utilize a succinimide dispersant.

Perozzi does not disclose (i) the lubricating oil for use as gear oil (ii) the instantly claimed component D in the lubricating oil composition, or (iii) the polysulfide mixture comprised of di-t-butyl disulfide, di-t-butyl trisulfide, and di-t-butyl tetrasulfide.

With respect to (i) above, the term "gear oil" is an intended use phrase and is given no patentable weight. The examiner's position is supported by case law, which holds that "where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention, the preamble is not a claim limitation." *Rowe v. Dror*, 112 F.3d 473, 478, 42 USPQ2d 1550, 1553 (Fed. Cir. 1997) and MPEP 2111.02.

With respect to (ii) above, Perozzi discloses the addition of one or more antiwear agents including amine salts of phosphorus acids (column 16, lines 19-25). Waters discloses a lubricating composition comprising a metal-free anti-wear or load carrying additive (page 2, lines 18-24). This additive is further disclosed as di-hydrocarbyl thiophosphate amine salt, which clearly overlaps the instantly claimed component D (page 2, lines 47-53). The anti-wear or load carrying additive is present in the composition from 0.05 to 3wt%. Waters teaches that the additive is advantageous when added to a lubricating composition since it is zinc free (page 2, lines 7-9). Lubricating fluids that contain zinc pollute the land when spillage occurs. Therefore, since Perozzi discloses an antiwear agent as an amine salt of phosphorus acid and Waters discloses a specific amine salt of phosphorus acid antiwear agent that is

advantageous by not contributing to pollution, it would have been obvious for Perozzi to utilize the antiwear agent disclosed by Waters.

With regard to (iii) above, Perozzi discloses the addition of a mixture of dihydrocarbyl polysulfides to aid in antiwear or extreme pressure effects. Perozzi teaches that these additives are well known in the art. Ozbalik also discloses a composition comprised of a mixture of dihydrocarbyl polysulfides, specifically dihydrocarbyl disulfide, dihydrocarbyl trisulfide, and dihydrocarbyl tetrasulfide (column 1, lines 11-12; column 2, lines 62-68). The polysulfide mixture is designed to comprise a high percentage of dihydrocarbyl di- and tri-sulfides and less high dihydrocarbyl polysulfides to achieve excellent use as an extreme pressure lubricant additive (column 1, lines 40-51). This mixture advantageously exhibits extreme pressure and reduced wear properties under high torque and low speed applications (column 3, lines 1-6). The polysulfides additionally have a low corrositivity to copper containing metals (column 3, lines 5-6). Ozbalik teaches the mixture comprises 17.1 mg disulfide, 44.1 mg trisulfide, and 31.1 mg tetrasulfide which correspond to a sulfur activity of greater than 125 mg in the Copper Corrosion Test (column 11, line 64 through column 12, lines 18). Since Perozzi only broadly discloses a dihydrocarbyl polysulfide mixture and Ozbalik teaches a specific mixture that is advantageous, it would have been obvious for Perozzi to use the mixture disclosed by Ozbalik.

With regard to **claim 4**, Perozzi teaches the extreme pressure additives, which includes the dihydrocarbyl polysulfide mixture, is present in the composition from 0.001

to 5wt% (column 17, lines 20-24). This clearly overlaps the claimed range of less than about 3.5wt%.

With regard to **claims 5 and 8**, the di-hydrocarbyl thiophosphate amine salt of Waters clearly overlaps the product of the mixture of dicyclopentadiene and dialkyldithiophosphoric acid and the product of the mixture of dibutylhydrogen phosphite, sulfur, and an amine.

5. **Claims 7 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Perozzi (US 5,498,355) in view of Waters (EP 0,434,464 A1) and Ozbalik (US 5,242,613) as applied to claim 1 above, and further in view of Milner (US 6,133,207).

Perozzi in view of Waters and Ozbalik, as discussed above and incorporated here by reference, disclose a gear oil lubricant comprised of hydrocarbyl polysulfides, dihydrocarbyl dithiophosphate ester, and a dihydrocarbyl (mono)thiophosphate ester.

The combination of Perozzi, Waters, and Ozbalik is silent as to whether the dihydrocarbyl (mono)thiophosphate amine salt is free of phosphites.

Milner teaches that the additive combination of hydrocarbyl polysulfides and dihydrocarbyl (mono)thiophosphate amine salts produces a strong odor (column 1, lines 40-55; column 2, lines 30-44; column 3, lines 16-20). The disclosed examples show that when phosphite was completely converted to the thiophosphate amine salt, no odor was generated (Inventive Example 2, column 4; Inventive Example 4, column 4 through column 5). However, when the phosphite was not completely converted, a strong odor was generated (Comparative Example 1, column 4; Comparative Example 5, column 5).

This strong odor invites many concerns from residential areas near manufacturing plants that might lead to the plant closing down by orders from the EPA (column 2, line 59 through column 3, line 9). Therefore, it would have been obvious for the combination of Perozzi in view of Walters and Ozbalik to produce thiophosphate amine salts free of phosphites to eliminate the strong odor.

6. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Perozzi (US 5,498,355) in view of Waters (EP 0,434,464 A1) and Ozbalik (US 5,242,613) as applied to claim 1 above, and further in view of Walters (EP 0,744,456 A2).

Perozzi in view of Waters and Ozbalik, as discussed above and incorporated here by reference, disclose a gear oil lubricant comprised of hydrocarbyl polysulfides, dihydrocarbyl dithiophosphate ester, and a dihydrocarbyl (mono)thiophosphate ester.

If Applicant were to argue that Waters does not disclose the product of the mixture of dibutylhydrogen phosphite, sulfur, and an amine, Walters also discloses a gear oil lubricant comprised of a base oil hydrocarbyl polysulfide, and a dihydrocarbyl (mono)thiophosphate ester. The thiophosphate amine salt is further disclosed as being the product of a dihydrocarbyl hydrogen phosphite, such as dialkyl hydrogen phosphite, sulfur, and one or more amines (page 6, lines 38-57). Since this production method is known to one of ordinary skill in the lubricant art, it would have been obvious for the dihydrocarbyl (mono)thiophosphate ester of Perozzi to also be made from a dibutylhydrogen phosphite, sulfur, and an amine.

7. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Perozzi (US 5,498,355) in view of Waters (US EP 0,434,464 A1), Ozbalik (US 5,242,613), and Minn (US 4,282,153).

Perozzi in view of Waters and Ozbalik, as discussed above and incorporated here by reference, disclose a gear oil lubricant comprised of hydrocarbyl polysulfides, dihydrocarbyl dithiophosphate ester, and a dihydrocarbyl (mono)thiophosphate ester.

If Applicant were to argue that Waters does not disclose the product of the mixture of dicyclopentadiene and dialkyldithiophosphoric acid, Minn discloses a method to produce a dihydrocarbyl dithiophosphate involving a reaction mixture of O,O-diethyl dithiophosphoric acid, a dialkyldithiophosphoric acid, and dicyclopentadiene (Example 3, column 3). The reaction produced bis(O,O-diethyl dithiophosphate), which is a dihydrocarbyl dithiophosphate. Since Minn discloses a successful method for producing a dihydrocarbyl dithiophosphate, it would have been obvious for Perozzi to also utilize this method, since the scope of Perozzi includes any suitable method.

Response to Arguments

8. Applicant's arguments filed 03/03/2010 have been fully considered but they are not persuasive.

Specifically, applicant argues (A) that Ozbalik does not disclose a polysulfide mixture with a sulfur activity greater than 125 mg in the Copper Corrosion Test since the values in Table 7 of Ozbalik are taken after the reaction with DBHP/Amine mixture.

With respect to argument (A), Component B in the instant claims recites "a mixture" so that it is open to other compounds than listed. Therefore, it is the Examiner's position that the presence of the DBHP/Amine mixture combined with the polysulfides of Ozbalik to form a CCT value of 239.7 (Table 7) overlaps the claimed Component B. Alternatively, Applicant has not shown that just the polysulfides alone, without the DBHP/Amine mixture and without treatment with organophosphorus, would not overlap the claimed CCT values. Perozzi teaches a polysulfide mixture and Ozbalik is used for the different amounts of each polysulfide, not for any additional compounds or treatments.

Specifically, applicant argues (B) that Perozzi is directed to engine oils and EP '464 is directed to hydraulic fluids so that Perozzi, who teaches the use of an anti-wear agent, would not use the anti-wear agent of EP '464.

With respect to argument (B), many additives are used in either engine oils or hydraulic fluids so that the fact that applicant argues the two fluids are different is not found persuasive (see, for e.g. paragraph [0441] of US 2010/0137173 A1) to Sheets et al. or paragraph [0010] of US 2002/0032293 A1 to Bryant et al.).

Specifically, applicant argues (C) that Perozzi is not focused on anti-wear agents and even lists the agent as optional.

With respect to argument (C), Perozzi still discloses the use of such a compound so Perozzi anticipates the use of an anti-wear agent. Furthermore, such agents are well known and commonly used in the lubricant art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AMY T. LANG whose telephone number is (571)272-9057. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anhtuan Nguyen can be reached on 571-272-4963. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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